(3) Non-Technical Abstract

Head and neck cancers, otherwise known as squamous cell carcinomas of the head and neck (SCCHN), produce increased amounts of a growth factor receptor, the epidermal growth factor receptor (EGFR). Stimulation of this growth factor receptor by the growth factors produced by the tumor cells, increases the growth of these cancer cells in tissue culture. In contrast, normal cells produce very little EGFR and EGFR is not important for the growth of normal cells. To determine whether EGFR production contributes to tumor growth in animals, we placed the EGFR gene in the reverse order (antisense) into a piece of DNA (plasmid) in order to interfere with EGFR production. This EGFR antisense DNA was injected into human SCCHN tumors grown in mice with abnormal immune systems, resulting in inhibition of tumor growth, decreased EGFR levels and increased cell death (apoptosis). The tumors did not grow, even after treatments were stopped. In animals with normal immune systems, the EGFR antisense DNA did not cause any damage to the organs and was primarily detected at the site of injection for up to several days after a single treatment. We propose to inject this EGFR antisense gene into head and neck cancers to determine whether this approach may be a safe and effective means treating cancers that produce increased EGFR.